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Date: November 30, 2006

No. of Sheets (including cover): 8

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Subject: Patent Application
Docket No: YOR920030058US1
Serial No: 10/663,285

Comments:
Notice of Appeal and Pre-Appeal Brief Request for Review attached

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Doc Code: AP.PRE.REQ

PTO/SB/33 (07-05)
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): YOR920030058US1

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on 11/30/06

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Application Number	Filed
10/663,285	9/16/03

First Named Inventor: David Bradley

Art Unit	Examiner
2116	F. Rahman

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☑ attorney or agent of record. Registration number 30374
- ☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

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NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted.

Claims 1-20 are pending in the application. The Examiner has rejected Claims 12, 15, 16 and 18 under 35 USC 103(a) as being unpatentable over AAPA in view of Fung; Claims 1, 3-6, 7-9, 11, 13-14, 17 and 19-20 as unpatentable over AAPA in view of Fung and further in view of Pinheiro.

The invention provides a method, system and program storage device for managing workload on a system comprising a plurality of resources on which virtual machines are running. The claims recite means and steps for calculating the number of needed resources, comparing the number of needed resources with the number of available resources and migrating at least one virtual machine (VM) from one physical resource to another by instructing the VM to halt processing, copy entire stat into storage, move and resume processing at different physical resource.

The Examiner has failed to understand that running a virtual machine at a resource is not the same as simply performing an assigned task at a resource. As taught in the present Specification, virtual machine (VM) technology abstracts the physical resources of a given server into one or more encapsulated, logically isolated operating system instances. As such, a VM is not simply a task for execution, but comprises an operating system instance and the applications associated therewith. A VM must

necessarily maintain state in order to be moved from one resource to another. Under the invention, when the relationship between needed resources and available resources has been determined, steps are taken to instruct the VM to migrate workload from at least one resource to at least one other resource. Once the migration has occurred, power management steps can be taken, such as powering down or powering off resources from which the VMs have migrated. Applicants note that it is not simply a task or a plurality of tasks that are being moved. Rather, at least one virtual machine, comprising an operating system instance and applications, is being moved. Further, the VM is not simply shifted, but is instructed to migrate itself from one resource to another resource. In order to migrate, the VM must maintain its state by pausing, copying its state into a storage location, and then resuming processing at the new location. Applicants respectfully assert that instructing a VM to migrate itself to another resource is not taught or suggested by the prior art.

The Examiner has cited Applicants' admitted prior art (AAPA) against the claim language. The AAPA acknowledges that workload balancing is known, that power management is known, and that VMs are known. However, as taught in the Specification, no prior mechanism existed for balancing

workload and managing power for instances that require that state be maintained, and no mechanism existed for VMs. The Examiner concludes that under the AAPA, the number of resources "must be determined". However, the Examiner does not cite any specific teaching of steps or means for determining numbers of resources (needed or available). The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination "must be based on objective evidence of record" and that "this precedent has been reinforced in myriad decisions, and cannot be dispensed with." (In re Lee, 277 F. 3d 1338, 1343 (Fed. Cir. 2002)). Further, the Federal Circuit has stated that "conclusory statements" by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved "on subjective belief and unknown authority" (Id. at 1343-1344). As such, the Examiner has not adequately supported the conclusion that the AAPA teaches the claim features.

The Examiner has also erred in interpreting the Applicants' description of Fig. 1. The Examiner wants the figure labeled as "prior art" and cites the passages describing Fig. 1 as AAPA against the claims. What Fig. 1 shows is workload assigned to VMs being "distributed as

evenly as possible across all of the servers" (page 9), in accordance with prior art workload balancing. However, rather than instructing VMs to start at workload balanced resources and waiting for the VMs to complete their tasks before again balancing workload, the present invention instructs state-maintaining migratable VMs to suspend their work and move to a different location. The AAPA does not teach or suggest instructing VMs to pause, copy state, move and resume processing at a new physical resource.

Moreover, the additional Fung teachings do not provide means or steps for managing a workload and power in a system wherein VMs are operating. Fung teaches workload shifting and power management among a plurality of nodes. Fung does not teach or suggest that the workload comprise VMs. Further, Fung does not teach or suggest that the management of the workload comprises instructing at least one VM to migrate. As stated above, moving an instruction from one node to another is not the same as nor suggestive of instructing a VM to migrate.

For a determination of obviousness, the prior art must teach or suggest all of the claim limitations. "All words in a claim must be considered in judging the patentability of that claim against the prior art" (*In re Wilson*, 424 F. 2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970). If

the cited references fail to teach each and every one of the claim limitations, a *prima facie* case of obviousness has not been established by the Examiner. Since neither the AAPA nor Fung teaches or suggests VMs or the management of workload and power based on instructing VMs to migrate, it cannot be maintained that the combination of references obviates the invention as claimed.

Applicants further assert that the additionally-cited Pinheiro reference does not provide that which is missing from the AAPA and Fung combination. In citing Pinheiro, the Examiner concludes that sharing a file system among servers implies that the storage of the file system is shared. Even if a file system is shared, however, there is nothing in any of the cited references which teaches or suggests that a VM be instructed to migrate, and that the VM pauses, copies its state to a shared file, and then resumes processing at another location. The combination of AAPA, Fung, and Pinheiro simply does not teach or suggest the invention as claimed.

Applicants believe that the Examiner has erred in interpreting the teachings, erred in analogizing tasks to virtual machines, and erred in rejecting the claims as obvious without having established a *prima facie* case of obviousness.